

CLAIMS

- 5 1. An apparatus for detecting cumulative exposure to ultraviolet radiation, comprising
at least one membrane having at least a first membrane surface;
at least one base member having at least a first base member surface; and
at least one degradable bonding means, bonding, along a degradable bonding
interface, at least a portion of said first membrane surface to said first base
10 member surface;
wherein said degradable bonding means maintains said membrane in a biased
state;
wherein said degradable bonding means fails upon attaining a predetermined
cumulative exposure to ultraviolet radiation; and
15 wherein upon failure of said degradable bonding means, said membrane
reflexively restores itself to an unbiased state, to indicate said predetermined
cumulative exposure to ultraviolet radiation.
2. The apparatus of Claim 1, wherein said membrane, when in said unbiased state,
20 comprises a tactilely sensible protuberance providing tactile verification that said
membrane is in said unbiased state.
3. The apparatus of Claim 1, wherein said membrane, upon reflexively restoring
itself to said unbiased state, produces an audible sound, providing verification
25 that said membrane has restored itself to said unbiased state.
4. The apparatus of Claim 1, wherein said degradable bonding means is a

degradable adhesive possessing adhesive qualities degraded by continued exposure to ultraviolet radiation.

5. The apparatus of Claim 1, wherein said apparatus, upon said membrane returning to said unbiased state, exhibits a color and/or pattern change providing verification that said membrane has restored itself to said unbiased state.

6. The apparatus of Claim 5, wherein said color and/or pattern change is produced by a change in optical properties of said membrane upon returning to said unbiased state.

7. The apparatus of Claim 5, further comprising:

one or more color indicators exhibiting said color change;

wherein said membrane is a substantially optically transparent membrane; and

wherein said color change is observed through said membrane.

8. The apparatus of Claim 7, wherein said color indicators are colored dies.

9. The apparatus of Claim 7, wherein said color indicators, before said failure of said degradable bonding means, are located within said degradable bonding means,

and, upon said failure of said degradable bonding means, are released from within said degradable bonding means.

10. The apparatus of Claim 7, wherein said color indicators are separated from one another by said degradable bonding interface, and

wherein upon said failure of said bonding means, said color indicators are substantially mixed with one another, producing said color change.

11. The apparatus of Claim 10, wherein said color indicators comprise indicators for a plurality of colors that, when at least one of said colors is substantially mixed with at least one other of said colors, produce at least a third color.

5

12. The apparatus of Claim 10, wherein said color indicators comprise a plurality of substantially colorless indicators that, when at least one of said colorless indicators is mixed with at least one other of said colorless indicators, produce at least one substantially colored indicator.

10

13. The apparatus of Claim 1, further comprising:

a removable adhesive for removably associating a second surface of said base member with a subject.

15

14. The apparatus of Claim 13, wherein said removable adhesive adheres said second surface of said base member to a skin surface of a person.

20

15. The apparatus of Claim 13, wherein said membrane, upon reflexively restoring itself to said unbiased state, produces vibrations tactilely sensible to said person, said vibrations providing verification that said membrane has restored itself to said unbiased state.

25

16. The apparatus of Claim 14, wherein said membrane and said base allow diffusion of water vapor and atmospheric gases at rates substantially equal to those of said skin of said person.

17. The apparatus of Claim 14, wherein said membrane and said base absorb and exude topical solutions to a degree substantially equal to that of said skin surface of said person.

5

18. The apparatus of Claim 1, wherein said at least one membrane, said at least one base member, and said at least one degradable bonding means, are deployed at a plurality of locations.

10 19. The apparatus of Claim 1, further comprising:

a plurality of said degradable bonding means that collectively fail over at a range of predetermined cumulative exposures to indicate increasing levels of ultraviolet exposure.

15 20. The apparatus of Claim 19, wherein said plurality of degradable bonding means are provided within a single sensor array.

21. The apparatus of Claim 1, wherein said biased state is any of biased toward a user's skin surface and biased away from a user's skin surface.